

Bringing Modeling to the People through the Kentucky Watershed Modeling Information Portal (KWMIP)

Environmental Information Symposium

Supporting Decisions to Achieve Environmental Results

**Sam Bacharach,
Open Geospatial Consortium**

**Demetrio Zourarakis, Ph.D.
Kentucky Commonwealth Office of Technology**

**Karen Schaffer
FMSM Engineers**

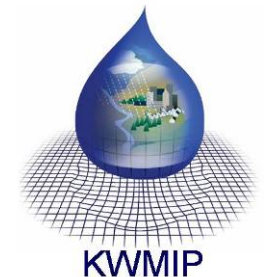
**November, 2005
Las Vegas, Nevada**



Kentucky Watershed Modeling Information Portal

Presentation Overview

- Background
- Project Overview
- Partners
- TAG
- Objectives, Products, Status
- Leveraging Data and Projects
- Next Steps



Why KWMIP?

Increase in Model Use

- ❑ TMDLs needed for 2,000 impaired pollutant/waterbodies in KY

Improve Modeling Efficiency

- ❑ KWMIP compiles and formats (some) model input data

Improve Model Consistency

- ❑ Flow in ungaged streams, precipitation and temperature

Train Water Resource Managers

- ❑ Models as Decision Support Tools

Train Modelers

- ❑ KWMIP and new datasets



KWMIP Award

- EPA Environmental Information Exchange Network Challenge Grant
- \$750,000 Cooperative Agreement between USEPA and KY Commonwealth Office of Technology (COT)
- Project Period: October 2004 – September 2006
- Interface with Environmental Information Exchange Network
- Vendor neutral links to GIS and databases

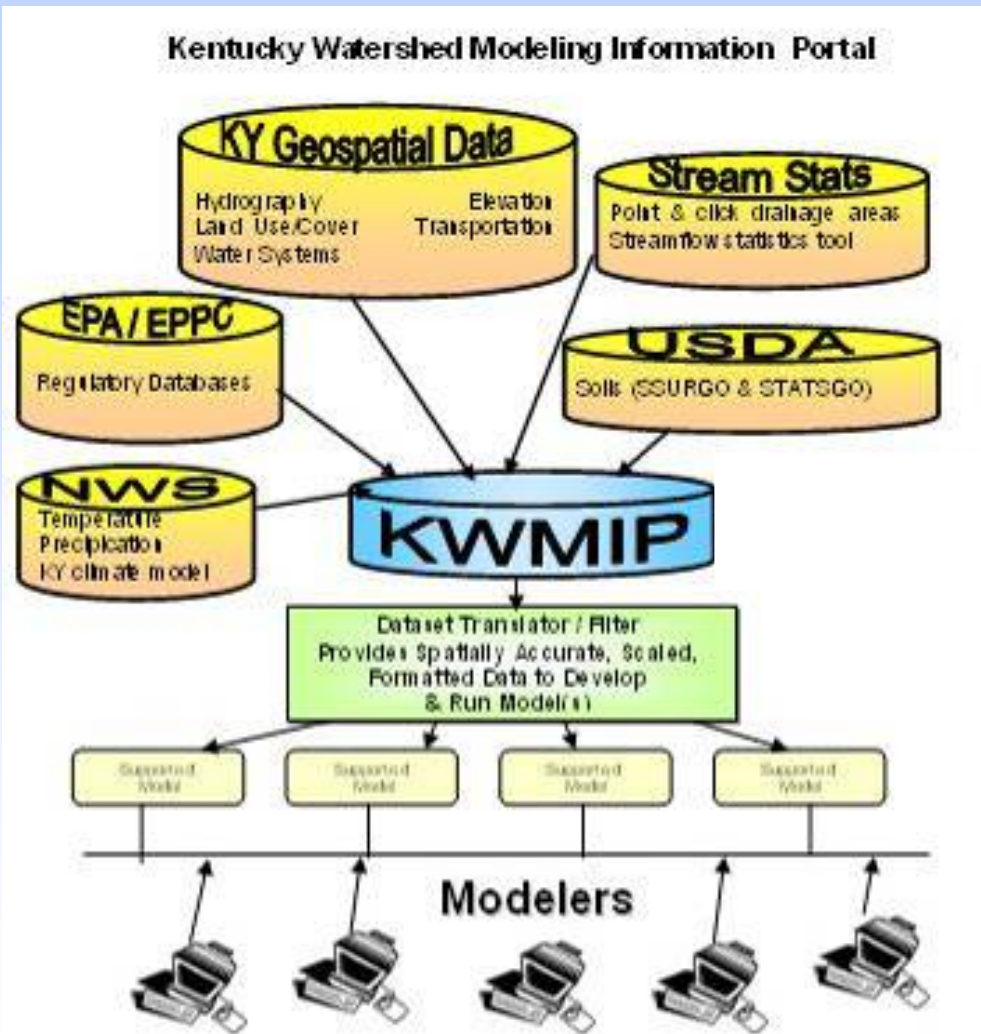
Grant Link: <http://www.epa.gov/Networkg/Exchange>
Network Link:

<http://www.exchangenetwork.net/index.htm>

KWMIP Website URL: <http://kwmip.ky.gov>



KWMIP Vision



KWMIP In Action

- Trained modelers select from 2-5 supported models and a watershed or area of interest.
- KWMIP locates necessary data, clips, formats and ships to modeler for use.



KWMIP Approach

User Needs Analysis – TAG identified 10 candidate models

Build KY Climate Model (ongoing)

Use Case – Project Partners & TAG define KWMIP functions

Build Pilot System (include KY Climate Model)

Test Pilot System

Install Operational System

Train –managers and modelers

Communicate – Public and private sector

Web-Enable USEPA's Southeast Ecological Framework
GeoBook.

Maintain and Finance Operational System

Next Steps!

9/06



KWMIP Partners

U.S. EPA Grantor

Gary Harp, KY Division of Geographic Information Principal Investigator

Mark Ayers
USGS Water
Co-awardee
Precipitation &
temperature
modeling

Nick VanDriel
USGS
Geography
Co-awardee
Data and web
mapping
services

Sam Bacharach, Open
GeoSpatial Consortium
(OGC) *Co-awardee*
User Needs Assessment,
Portal Development,
Testing, Installation

Bill Caldwell
KY DEP
Co-awardee
Project input and
review

OGC Sub-Contractors
Karen Schaffer, FMSM -
Project Coordination
Andrew Brenner,
Sanborn Solutions –
Web-Enable EPA GeoBook

**Technical Advisory Group
(TAG)**



Technical Advisory Group

Provides user insight and direction

- ❑ What models do they use?
- ❑ What data can we make it easier for them to use?
- ❑ How would they like a system to appear?

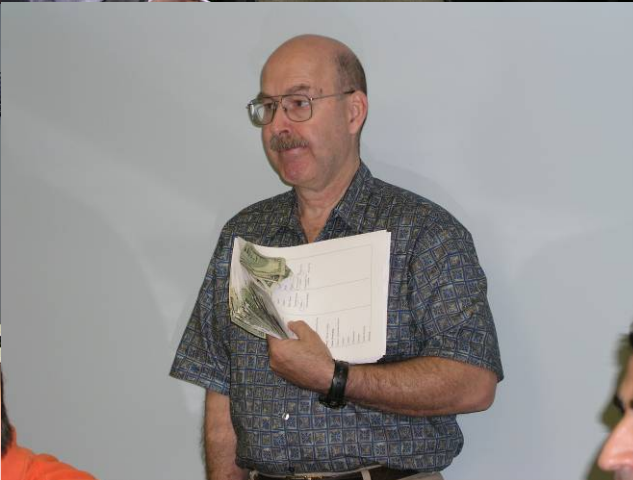
User Needs Assessment

- ❑ Provided input in face to face meetings
- ❑ Reviewed document via email

Use Case Design

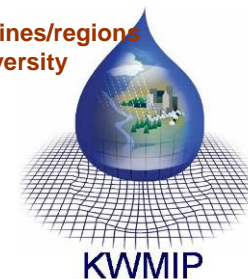
- ❑ OGC and FMSM provided draft
- ❑ TAG reviewed via email and in face to face meeting





TAG (Technical Advisory Group)

American Public Works Association
 CDP Engineers
 City of Bowling Green
 Cumberland Environmental Group
 Eastern Kentucky University
 EPA – various units
 FEMA
 FMSM Engineers
 GRW
 Kentucky Department of Environmental Protection
 Kentucky Division of Water
 Kentucky Geological Survey
 Kentucky Pride
 Kentucky Society of Professional Engineers
 Kentucky Waterways Alliance
 Khafra Engineering Consultants
 Lexington Fayette County Urban Government
 Limno-Tech
 Louisville Metro Sewer District
 Morehead State University
 Murray State University
 National Weather Service Ohio River Forecast Center
 Northern Kentucky University
 ORSANCO
 PlanGraphics
 Tennessee Valley Authority
 Tetra Tech
 The Nature Conservancy
 Third Rock
 University of Kentucky - various units
 University of Louisville - Stream Restoration Institute
 USACE
 USDA-NRCS
 USGS – various disciplines/regions
 Western Kentucky University



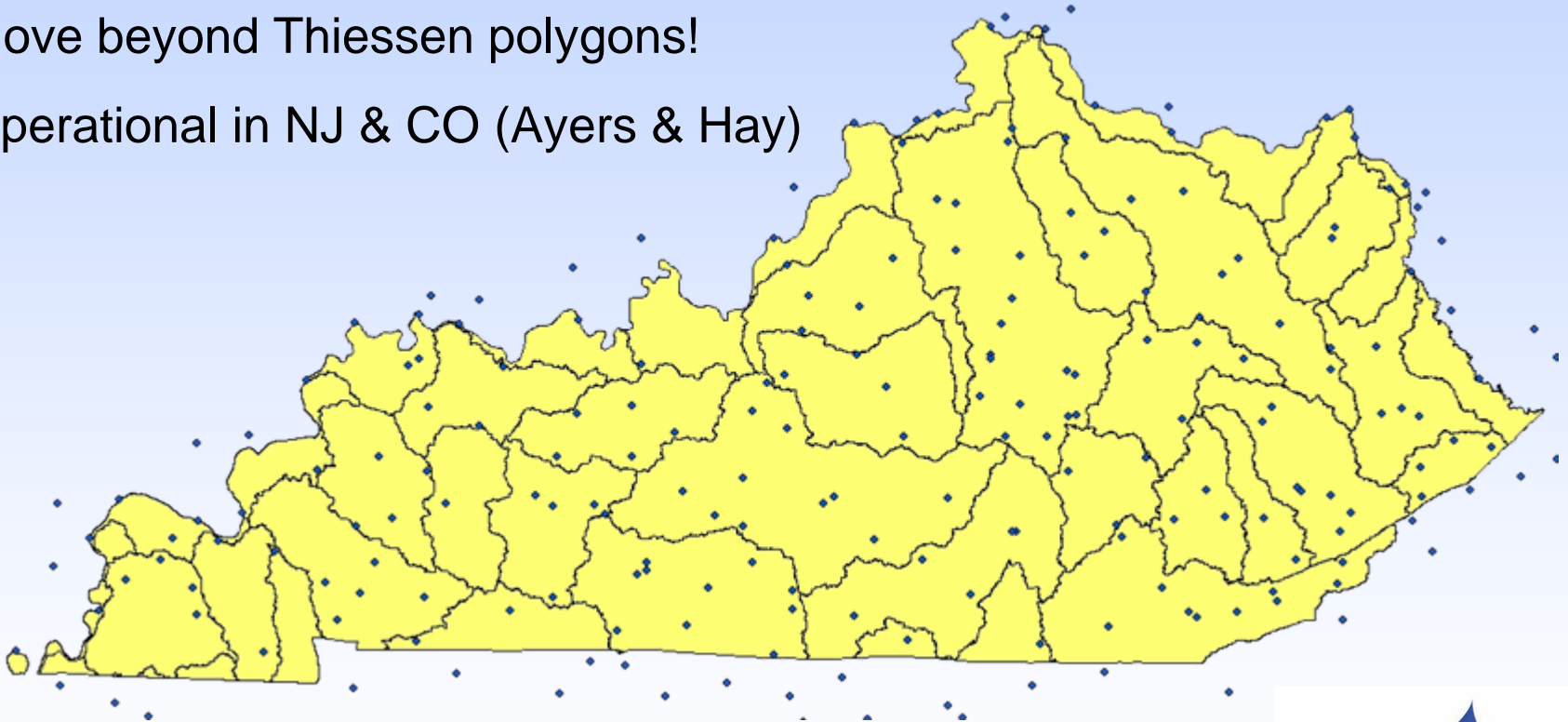
USGS Developing KY Climate Model

Temperature & Precipitation

Spatial Regression Analysis

Move beyond Thiessen polygons!

Operational in NJ & CO (Ayers & Hay)



KWMIP Leverages Data and Projects

Environmental Information Exchange Network

- KDEP databases – TEMPO & COMPASS
- USEPA databases – STORET, PCS

USEPA Region IV Modeling Toolbox & BASINS

- Databases, GIS, Models

KY GeoNet

- *Numerous* KY spatial data layers useful for modeling
- www.kygeonet.ky.gov

USGS: Stream Stats

- Flow Statistics, On-line WS Delineations, Estimate N&P
- <http://kygeonet.ky.gov/kyhydro/viewer.htm> Stream Data

Karst Hydrology Initiative

- 55% of KY – complex hydrology
- Multi-state mapping & science



KWMIP Leverages Data and Services

KLS has delivered

- An accurate baseline snapshot of the landscape
- High resolution imagery and land cover for selected counties
- Tool for land owners for forest management
- Web mapping tool for county government for planning and data access

KLC will expand

- OGC interoperability portal
- Data access to a new tier of counties and cities
- Remote sensing analysis and on-line change detection tools

KWMIP will enhance

- Model use and consistency with clipped and formatted watershed model input data
- Use of watershed models in Kentucky decision-making



Next Steps!

Institutionalize operational system

Incorporate land use / land cover change analysis

Provide watershed visualizations

Expand to decision support tools & models

- ❑ LGEAN – Local Government Environmental Assistance Network
- ❑ <http://www.epa.gov/waterspace//index.html>

Web-based GIS

On-line Watershed Delineations

Interactive learning tools for managers & modelers



Questions and Contacts

<http://kwmip.ky.gov/>

<http://klc.ky.gov>

<http://kls.ky.gov>

Principal Investigator: Gary Harp, Director, Division of Geographic Information garyr.harp@ky.gov

Project Coordinator: Karen Schaffer, FMSM Engineers, kschaffer@fmsm.com

Government Technical Lead: Demetrio Zourarakis, Ph.D. demetrio.zourarakis@ky.gov

Open Geospatial Consortium Lead: Sam Bacharach sbacharach@opengeospatial.org

